WHAT IS CLAIMED IS:

1. A scanning-based apparatus for obtaining tomosynthesis data of an object comprising

- a divergent radiation source emitting radiation centered around an axis of symmetry;

- a radiation detector comprising a stack of line detectors, each being directed towards the divergent radiation source to allow a ray bundle of said radiation that propagates in a respective one of a plurality of different angles to enter the line detector;

- an object area arranged in the radiation path between said divergent radiation source and said radiation detector for housing said object;

- a device provided for moving said divergent radiation source and said radiation detector relative said object essentially linearly in a direction essentially orthogonal to said axis of symmetry, while each of said line detectors is adapted to record a plurality of line images of radiation as transmitted through said object in a respective one of said plurality of different angles, and

- a device provided for rotating said radiation detector an angle around an axis of rotation orthogonal to said axis of symmetry, the line detectors being, after said rotation, each directed towards the divergent radiation source to allow a ray bundle of said radiation that propagates in a respective one of a further plurality of different angles to enter the line detector, wherein

- said device provided for moving is further arranged to repeat the essential linear movement of said divergent radiation source and said radiation detector relative said object, while each of said line detectors is adapted to record a further plurality of line images of radiation as transmitted through said object in a respective one of said further plurality of different angles.

2. The apparatus of claim 1 wherein said axis of rotation is passing through said divergent radiation source.

3. The apparatus of claim 1 wherein

- said device for rotating is adapted to repeatedly rotate said radiation detector around said axis of rotation, the line detectors being, after each of said rotations, each directed towards the divergent radiation source to allow a ray bundle of said radiation that propagates in a respective angle to enter the line detector; and

- said device provided for moving is adapted, after each of said rotations, to repeat the essential linear movement of said divergent radiation source and said radiation detector relative said object, while each of said line detectors is adapted to record line images of radiation as transmitted through said object in a respective angle.

4. The apparatus of claim 1 wherein said line detectors are oriented to detect line images extending in a direction essentially orthogonal to said axis of symmetry and essentially orthogonal to the direction, in which said device for moving is provided to move said divergent radiation source and said radiation detector relative said object.

5. The apparatus of claim 4 wherein said direction, in which said line images extend, is parallel with said axis of rotation.

6. The apparatus of claim 1 wherein

- said line detectors are oriented to detect line images extending in a direction essentially orthogonal to said axis of symmetry and essentially parallel with the direction, in which said device for moving is provided to move said divergent radiation source and said radiation detector relative said object; and

- said direction, in which said line images extend, is essentially orthogonal to said axis of rotation.

7. The apparatus of claim 1 wherein said angle around said axis of rotation is smaller than a difference between two adjacent ones of said plurality of different angles.

8. The apparatus of claim 1 wherein said angle around said axis of rotation is equal to, or larger than, an angular range, over which said plurality of different angles is distributed.

9. The apparatus of claim 1 wherein said plurality of different angles is distributed over an angular range of at least 5°.

10. The apparatus of claim 1 wherein said plurality of different angles is distributed over an angular range of at least 10°.

11. The apparatus of claim 1 wherein said plurality of different angles is distributed over an angular range of at least 15°.

12. The apparatus of claim 1 wherein the number of line detectors in said stack of line detectors is at least 3.

13. The apparatus of claim 1 wherein the number of line detectors in said stack of line detectors is at least 10.

14. The apparatus of claim 1 wherein the number of line detectors in said stack of line detectors is at least 25.

15. The apparatus of claim 1 wherein said device for moving is adapted to move said divergent radiation source and said radiation detector relative said object a length which is sufficient for scanning each of said line detectors across the entire object to obtain, for each of said line detectors, a two-dimensional image of radiation as transmitted through said object in a respective one of said plurality of different angles.

16. The apparatus of claim 1 wherein

- said divergent radiation source is an X-ray source; and

- said line detectors are each a gaseous-based ionization detector, wherein electrons freed as a result of ionization by a respective ray bundle are accelerated in a direction essentially perpendicular to the direction of that ray bundle.

17. The apparatus of claim 16 wherein said gaseous-based ionization detector is an electron avalanche detector.

18. The apparatus of claim 1 wherein said line detectors are each any of a diode array, a scintillator-based array, a CCD array, a TFT- or CMOS-based detector, or a liquid detector.

19. The apparatus of claim 1 comprising a collimator arranged in the radiation path between said radiation source and said object area, said collimator preventing radiation, which is not directed towards said line detectors, from impinging on said object, thereby reducing the radiation dose to said object.

20. A scanning-based method for obtaining tomosynthesis data of an object using a divergent radiation source, which emits radiation centered around an axis of symmetry; and a radiation detector comprising a stack of line detectors, each being directed towards the divergent radiation source to allow a ray bundle of said radiation that propagates in a respective one of a plurality of different angles to enter the line detector, said method comprising the steps of:

- arranging said object in the radiation path between said divergent radiation source and said radiation detector;

- moving said divergent radiation source and said radiation detector relative said object essentially linearly in a direction essentially orthogonal to said axis of symmetry, while, by each of said line detectors, recording a plurality of line images of radiation as transmitted through said object in a respective one of said plurality of different angles;

- rotating said radiation detector an angle around an axis of rotation orthogonal to said axis of symmetry, the line detectors being, after said rotation, each directed towards the divergent radiation source to allow a ray bundle of said

radiation that propagates in a respective one of a further plurality of different angles to enter the line detector; and

- repeating the essential linear movement of said divergent radiation source and said radiation detector relative said object, while each of said line detectors is adapted to record a further plurality of line images of radiation as transmitted through said object in a respective one of said further plurality of different angles.

21. The method of claim 20 wherein said axis of rotation is passing through said divergent radiation source.

22. The method of claim 20 wherein said step of moving comprises to move said divergent radiation source and said radiation detector relative said object a length which is sufficient for scanning each of said line detectors across the entire object to obtain, for each of said line detectors, a two-dimensional image of radiation as transmitted through said object in a respective one of said plurality of different angles.

23. The method of claim 20 wherein said angle around said axis of rotation, which said radiation detector is rotated, is smaller than a difference between two adjacent ones of said plurality of different angles.

24. The method of claim 20 wherein said angle around said axis of rotation, which said radiation detector is rotated, is equal to, or larger than, an angular range, over which said plurality of different angles is distributed.